TECHNOLOGY DEPARTMENT

15¢

MARCH 25, 1950

SCIENCE NEWS LETTER

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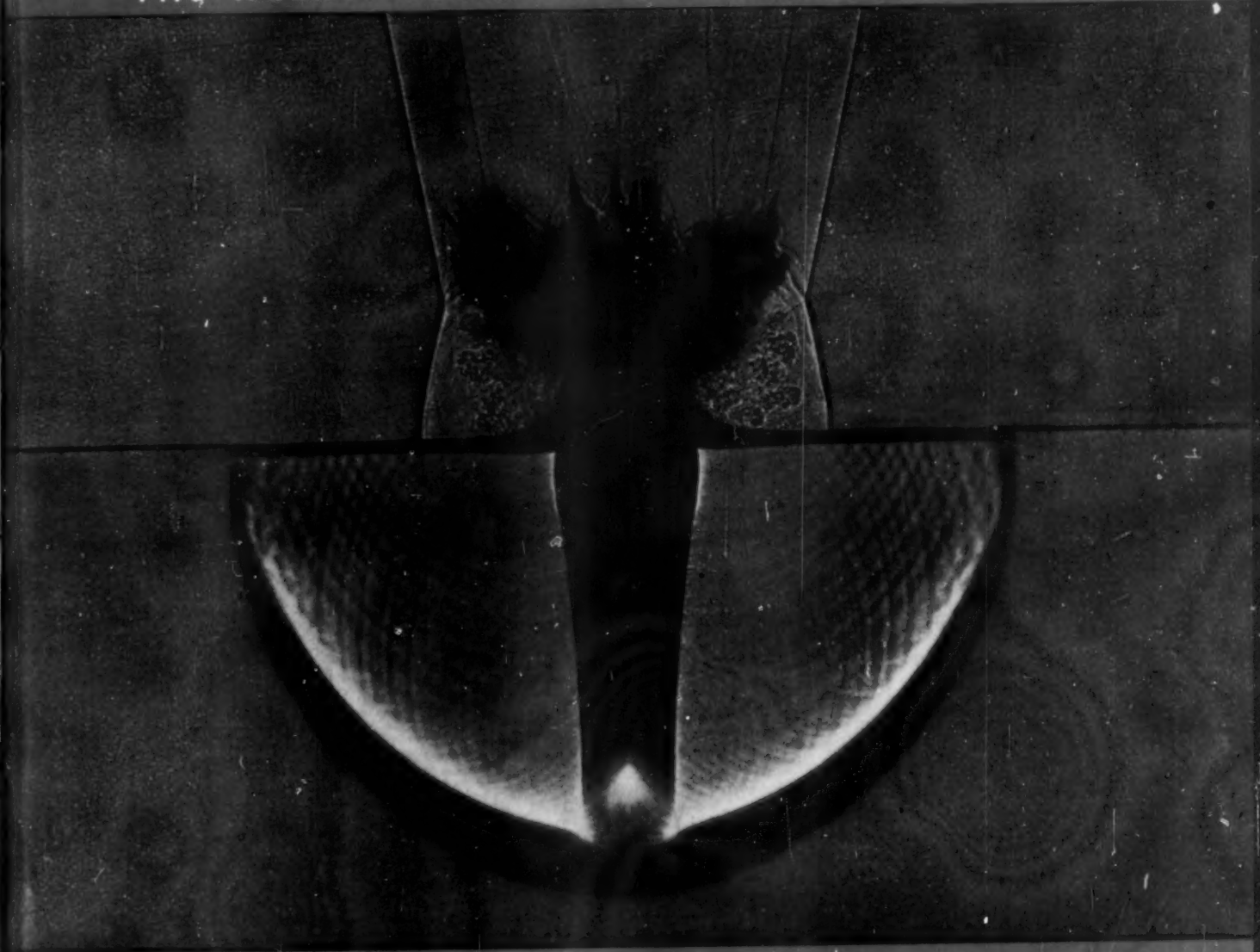
DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Pellet Hits the Water

See Page 182

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VOL. 57 NO. 12 PAGES 177-192

METEOROLOGY

Help in Water Problem

Weathermen can aid in the water supply problem by exploring rain-making, the evaluation of water supply and the governing of industry in areas by weather data.

➤ THE weatherman can help in the nation's water supply problem. Capt. Howard T. Orville, past president of the American Meteorological Society, suggested three main ways in which weathermen could help. He spoke as a guest of Watson Davis, Director of Science Service, over the nation-wide Columbia Broadcasting System.

First, the possibilities of artificial rain-making should be carefully looked into, said Capt. Orville, who is also head of the Aerological Service of the Navy. Second, better and longer-range weather forecasts will help us in evaluating the potential water supply in any given area. Third, the already amassed climatological data about our country should help in governing the amount of industrial expansion in any area.

Pointing out that New York City's water shortage was not the first in our country, Capt. Orville nevertheless said that, "it isn't true that our water supply is going down. There is an abundant supply over the United States as a whole."

He said that water supply problems were more local in character and usually resulted from exploitation of areas without thinking about the amount of available water. More knowledge of past rain and snow fall and better long range forecasting, he said, if given attention by industry and agriculture, would go a long way toward solving some of the water supply problems.

Capt. Orville pointed to the Weather Bureau's extended forecasts, recently released on a regular basis to newspapers and publications. He said that these were still in the experimental stage.

Artificial rain-making, he said, has not been entirely proved, but the preliminary results from Project Cirrus and other projects have been encouraging enough to warrant more, carefully controlled, experiments. He said that these future experiments may require careful evaluation by an impartial group of scientists.

Science News Letter, March 25, 1950

GEOLOGY

Clue to Gold in Ashes

➤ THE prospector's campfire will do more than keep him warm in the future. By testing the ashes scientifically, he may get a clue to gold, silver, perhaps even uranium in the area.

Two British Columbia geologists, Dr. Harry V. Warren and Robert E. Delavault, say the system for gold and silver works. Burning samples of various trees and forest plants which they cut near known gold deposits, they found measurable amounts of both precious metals, according to a paper in the monthly bulletin of the Geological Society of America.

But before you rush out to burn down the willow tree in your yard, consider the "measurable amounts"—something like one ounce of gold in 450 tons of wood, even if our house stands on a mother lode.

The relatively new science of hunting underground metals from their chemical traces in plants and trees, ground water and soil is called geochemical prospecting.

The Scandinavians made an important strike of manganese in the 1930's by using such techniques. Geologists and chemists of the U. S. Geological Survey told Science Service they have been working for about five years to find fast, rough tests prospectors might use in the field to unearth such metals as copper, nickel, lead and zinc. These are vital to U. S. industry.

Whether or not uranium may also be found by these methods was not disclosed by the Geological Survey scientists. But uranium is a heavy-metal cousin of gold and lead.

Dr. Earl Ingerson, head of the geochemistry unit of the Geological Survey, said, "We hope these new techniques will someday furnish a valuable tool for prospectors."

Science News Letter, March 25, 1950

INVENTION

Shaking Dust Mop Out Window Outmoded

➤ DRY-mop-shaking out the window is scheduled to go. A simple bellows cabinet newly patented, will take the dust out of the mop and collect it in a bag, and does the job without polluting the atmosphere or pestering the neighbors.

It is not the first device developed for cleaning the dry mop but this one is an improved type, easily carried from place to place and easy to operate. The bellows are at the top. The dust bag is at the bottom. The mop to be cleaned is placed between. Manipulating the cover up and down with one hand works the bellows.

The moving air agitates the fibers of the mop and carries the dust from it to the bag below. The bag is similar to those used in ordinary household vacuum cleaners. The air goes through while the dust is filtered out. The bag is easily removed for emptying when required.

Albert Deans Fairgrieve, Vancouver, British Columbia, received American patent 2,499,183 for this invention.

Science News Letter, March 25, 1950

AERONAUTICS

Needed: Improvement in American Civil Airports

➤ THERE is much need for improvement of America's 6,200 civil airports, it was revealed in Washington by the 1949 ratings of the Aircraft Owners and Pilots Association.

Only 709 of these 6,200 airports are rated either as "superior" or "above average" by the nearly 40,000 pilot-members of the association. These figures for 1949 show a decrease of 16 rated airports over 1948.

The association's rating system is based entirely on reports received from members throughout the year. Special rating cards are supplied to all members. They are urged to fill the cards in for all airports they use on any flight, and mail them to the national headquarters.

A list of the superior and above-average airports is published by the association for the benefit of its members. The list indicates also whether the ports have transportation, overnight accommodations and restaurant facilities.

Science News Letter, March 25, 1950

CHEMISTRY-ENGINEERING

"Toothpaste-Tube" Pump Handles Corrosive Material

➤ A NEW pump which utilizes the principle of the common toothpaste tube in handling highly corrosive liquids and gases has been designed and built by two University of Texas chemists.

Mixtures which would quickly ruin metal parts of any ordinary pump are squeezed through a plastic-lined rubber tube by a series of rollers mounted on the side of a revolving disk. As the disk spins, the rollers successively flatten the tube against a semi-circular frame and push ahead anything inside.

The pump is described by E. E. Glenn, Jr., and Norman Hackerman in the REVIEW OF SCIENTIFIC INSTRUMENTS (Feb.).

They report one gallon per minute can be delivered against a three-foot head. Corrosive mixtures with a high gas to liquid ratio can be carried. They touch only an inner tube of Tygon, a synthetic resin plastic material. The rubber outer tube takes the wear from the rollers.

Science News Letter, March 25, 1950

MEDICINE

Separate Purer Part ACTH

A purer fraction of ACTH has been isolated. This may lead to a substance which would combat the shortage of ACTH and minimize the harmful side effect.

➤ THE man who first isolated ACTH now has a purer, more powerful and less harmful form of the famous "anti-arthritis" hormone.

The scientist is Dr. C. H. Li, professor of biochemistry at the University of California. The use of a fraction of the ACTH hormone, obtained by breaking down the ACTH molecule chemically, was first reported last December.

Just returned from Sweden, where he has been directing a project aimed at synthesizing the hormone, Dr. Li disclosed progress which eventually may produce a substance which would overcome the shortage of ACTH and would minimize the harmful side effects resulting from continued administration of the whole hormone.

Dr. Li reported on the results of treatment of three patients in Sweden with the new, purer fraction. So powerful is the new fraction that 3 milligrams per day will give the same result as 100 milligrams of ACTH—the usual dosage.

The patients all derived the same beneficial effects from the fraction as they do from whole ACTH.

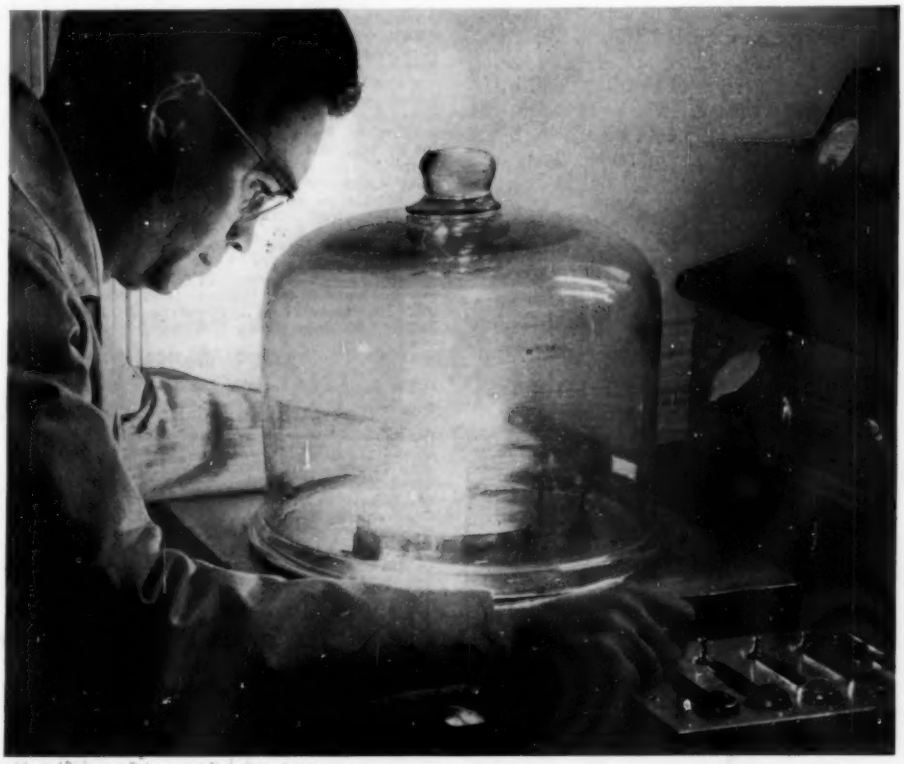
The scientist reported that since so much less hormone need be administered, the side effects—such as generation of diabetes and generally disturbance of carbohydrate metabolism—were diminished. He cautioned that the new substance has been used in only three cases, however, not enough from which to draw lasting conclusions.

Dr. Li also reported that real progress has been made in the direction of synthesizing the new ACTH fraction. It has a molecular weight of about 1,000, within the limits for synthesis; whereas whole ACTH has a molecular weight of about 20,000, so large as to be beyond synthesis. The fraction is called a peptide mixture, composed of eight amino acids. In some way this mixture retains the biological activity of the whole hormone.

The scientist is now directing two large projects involved with attempts to synthesize the hormone and evaluate its biological properties. One in Sweden is at Upsala, where the Medical Research Council of Sweden has placed at his disposal extensive facilities and a budget of 200,000 crowns. He is working in association with Dr. Arne Tiselius, Swedish Nobel Laureate. He will return to Sweden for a stay of a month in April.

Dr. Li is directing a similar project at Berkeley.

Science News Letter, March 25, 1950



URANIUM SHADOW SHOW—E. H. Rowe sprays a specimen with uranium atoms at a temperature, under the glass, of 3,600 degrees Fahrenheit. When placed under an electron microscope the part of the sample which has been coated with uranium will cast a shadow making it possible for scientists to study objects which formerly could not be seen even when magnified 100,000 times. Industry has recently been authorized to use uranium in commercial research.

MINING

Bauxite By-Products Are Recovered by New Process

➤ ARKANSAS bauxite ore, now being used as a source of alumina, contains valuable titanium and iron minerals, recoverable by a process just revealed by the U. S. Bureau of Mines. Recovery of these by-products will promote the use of domestic bauxite.

Methods of recovery of these present wastes are given in a report now available from the Bureau's publication section at Pittsburgh, Pa. Its title is "Titanium and Iron Minerals from Black Sands in Bauxite." It was prepared by W. A. Calhoun, Bureau metallurgist, Bauxite, Ark.

In extracting alumina from bauxite ores through a modified Bayer process at Bauxite, Ark., 80,000 tons of black sands and 392,500 tons of brown mud are now discarded each year as waste. Bureau tests show that about 100 tons of marketable iron ore and about 45 tons of low-grade ilmenite, a titanium ore, could be recovered from the black sands each day. Future tests on the brown mud waste products are planned.

Science News Letter, March 25, 1950

AGRICULTURE

Plant Timothy Grass Seeds Close for Large Crop

➤ PLANT your timothy grass seeds close together if you want a large crop.

Studies by Dr. Stella Champness of the Grassland Research Station, Stratford-on-Avon, England, have shown that differences in microclimate between areas with exposed soil and those with plant cover are significant. Sparsely seeded seedlings have a higher mortality than those planted close together, she reports in the journal, NATURE (Feb. 25).

This is due, she believes, to the changes in the climate in the immediate vicinity of the growing timothy plant. This in turn is dependent on the number of other plants, as well as the moisture and nutrients in the ground.

Science News Letter, March 25, 1950

ENTOMOLOGY

Death Rays Kill Insects

➤ A "DEATH ray" machine which will kill fruit flies and other insects contaminating food and commodities is now being used in experiments by the U. S. Bureau of Entomology and Plant Quarantine. The experiments were described in a speech by A. H. Yeomans of the bureau.

Using 2,500,000 volts, the experimental model shoots electrons at the insects in blasts lasting only one-millionth of a second. At a range of 12 inches, the electrons kill insects over a 14-inch square.

The machine used is called a capacitron, first developed by the Electronized Chemical Company, New York, for sterilizing and preserving foods. Experiments in killing insects with the "death ray" machine were begun at the request of Hawaiian agricultural experts who were worried about the presence of fruit flies in food exported from the islands.

The government entomologists are experimenting with the machine to determine whether the rays will harm the food for human use. The makers of the machine are pretty sure the rays will not be harmful to humans.

If the machines prove successful, they could be set up at ports of entry, or in warehouses where food is stored after it enters this country.

So far the rays have killed mosquitoes, fruit flies, carpet beetles, flour beetles and other kinds of insects. They work as well on insects in the egg or larva stage.

The one-millionth of a second blast sounds like a rifle shot and looks like a burst of flame, according to Mr. Yeomans.

Science News Letter, March 25, 1950

MEDICINE

Heart Uses Real Blood

➤ THE first artificial heart which pumps untreated blood from a real heart through a kidney or other organ and back to the real heart through a jugular vein has been devised by Dr. Lucien Brull of the University of Liege, Belgium. A preliminary announcement of this feat appears in SCIENCE (March 17).

Artificial hearts heretofore devised have pumped a salt solution or some blood substitute or, in some cases, blood which has been treated with heparin to keep it from clotting. In studies of the liver or kidney or various glands of the body, using a blood substitute is not entirely satisfactory because this creates a condition not normally present in the organ studied.

The artificial heart devised by Dr. Brull takes advantage of the fact that blood does not normally clot when it is in contact with the innermost lining of veins and arteries. It is constructed out of tubes which are lined with pieces of the aorta and other arteries and veins. A roller-pulley does the pumping to propel the blood through the artificial heart, the organ under study and back to the heart again.

The speed of the pulley can be regulated to vary the number of beats. The output of such a heart can easily reach up to one quart or more per minute against a pressure varying from the normal to 300 mm.

Results of experiments with the heart furnishing blood to a kidney will be reported at the International Congress of Physiology this summer.

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Question Box

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● RADIO

Saturday, April 1, 3:15-3:30 p. m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Mr. David Baldwin, Director of traffic and transportation of the National Safety Council, and Mr. Nils Lofgren, Driver Education Consultant of the National Safety Council, will discuss "Training Teen-Age Drivers in High School."

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ASTRONOMY

Retort to Velikovsky

Dr. Payne-Gaposchkin, astronomer, in her refutation of Velikovsky's theories points out the discrepancies between scientific fact and his theories.

➤ WITH the title, "Nonsense, Dr. Velikovsky!", the first detailed scientific answer to Dr. Immanuel Velikovsky's theory that the earth stood still a couple of times around 1500 B.C. appears in the issue of THE REPORTER (March 14).

Dr. Velikovsky's theories, appearing in condensed form in articles in HARPER'S, COLLIER'S and READER'S DIGEST, will be explained in several forthcoming books to be published by Macmillan.

Drawing upon mythology, the Bible and other sources, Dr. Velikovsky maintains that the planet Venus was a comet at the time of the Exodus. He says that this "comet" passed so close to the earth that the tail of the comet rained down upon the earth and that an electromagnetic attraction was set up which stopped the earth from revolving.

Dr. Cecilia Payne-Gaposchkin, Phillips astronomer at Harvard, is the author of THE REPORTER article. She says: "The earth is a gigantic, massive flywheel. Its energy of rotation is immense. To stop its rotation the same amount of energy would have to be applied to it, and could be applied only by impact. A heavy body that merely passed by could not have more than a very small effect on the earth's rate of rotation though it might disturb its motion in space . . . What then would have been the impact of a body almost equal in mass and size to the earth, as Venus is? It would have pulverized the earth. But nothing short of impact would stop the earth's rotation."

Assuming, for a moment that the earth did stop rotating, Dr. Payne-Gaposchkin points out that all bodies not attached to the surface of the earth, including the atmosphere and the oceans, would have continued their motion, and would have flown off with a speed of 900 miles an hour in the latitude of Egypt.

If the earth did stop rotating, asks the Harvard astronomer, what started it again? She says that the same energy of rotation would have had to be reapplied. Dr. Velikovsky maintains that if the magnetic field of the sun were to govern the earth's motion, then the earth could resume its rotation. Dr. Payne-Gaposchkin points out that the magnetic fields of both the sun and the earth have been measured and that their interaction is not strong enough, in millions of years, to restart the earth's rotation.

Dr. Payne-Gaposchkin gives the scientific arguments against other of Dr. Velikovsky's theories on astronomy. She goes into detail about the chemical makeup of the tail of a comet to show that the material in the tail could not have been the Biblical manna. She says that he has a "naive" picture of the atom. She disputes Dr. Velikovsky's statement that there was no record of Venus before 1500 B.C. by citing two such records—one back in 2000 B.C.

She concludes: "The road to fame and fortune for the 20th century scholar is clear. Never mind logic; never mind the precise meaning of words or the results of exact research. Employ the vocabulary of a dozen fields of learning. Use a liberal sprinkling of Biblical phrases."

Science News Letter, March 25, 1950

NUCLEAR PHYSICS

Germanium Radiation Counter Developed

➤ A GERMANIUM counter, using a positive-negative phenomenon produced by particle bombardment, has been developed by Dr. Karl Lark-Horovitz and collaborators at Purdue University, Lafayette, Ind.

The new counter, primarily a tool for research in nuclear physics, can count radiations of alpha and beta particles and of gamma rays, and can measure the directions in which they are distributed. Made of germanium, a rare metal, it is, considering its small effective volume, more sensitive than any other kind of counter heretofore developed.

The scientists change the character of half the germanium by bombarding it with deuterons, hearts of heavy hydrogen atoms. After that, it is really the boundary between the two types of germanium that acts as a counter. This boundary is called the P-N boundary for positive negative.

Another advantage of the new counter over the scintillation type counters is its extremely small size and compact form.

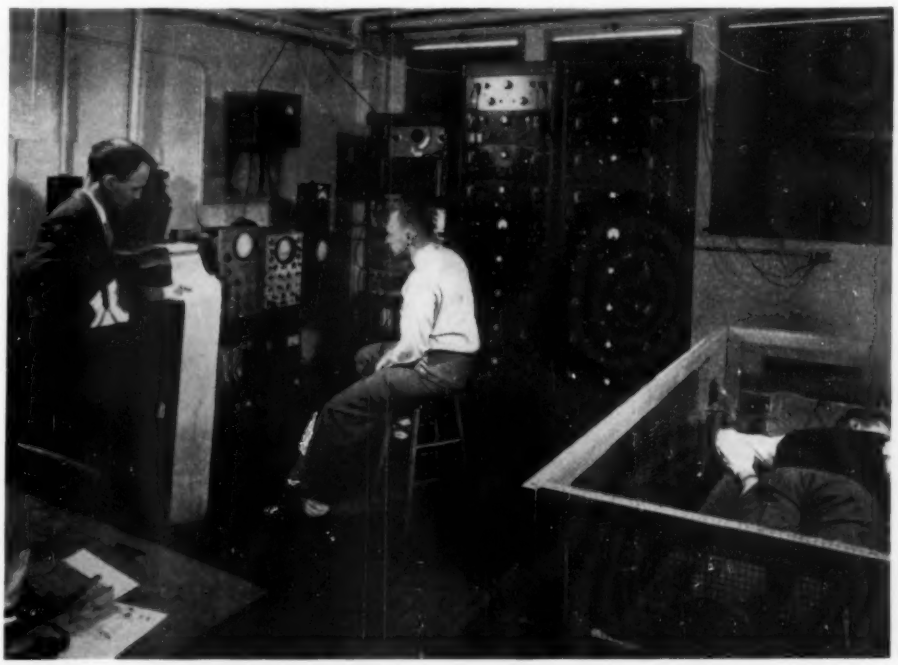
Science News Letter, March 25, 1950

ENGINEERING-PHYSIOLOGY

Radar Now Maps Human Heart and Brain

➤ THE human brain and heart are now being mapped by radar. As a result, scientists have discovered that the brain has actual waves of electrical energy with specific paths and very definite speeds. Some of these cover the entire brain and some are confined to one of its special areas.

Radar maps of the brain give a visible picture of overall brain activity. They differ from electroencephalograms heretofore used to measure electrical activity of the brain because the electroencephalograms show ac-



BRAIN MAPPING BY RADAR—Visual and printed records of electric waves in the human body are made by this equipment in the laboratory operated by Dr. Stanford Goldman and graduate student, W. F. Santelmann, Jr.

tivity of the "brain waves" only at specific points of the brain.

How the radar maps of brain and heart are made was described by Dr. Stanford Goldman of Syracuse University at the meeting in New York of the Institute of Radio Engineers. Dr. Goldman was formerly research associate at Massachusetts Institute of Technology where the equipment for radar mapping of brain and heart was first developed.

"Results already obtained," Dr. Goldman said, "indicate that the pictures will be useful for the diagnosis of disease in the heart and brain and in studying the physiology of these organs."

The equipment picks up the tiny electrical impulses which accompany the action of both heart and brain and converts them into a constantly moving map-like picture similar to those made by World War II radar sets. The "pick-ups" are nothing more than small wires held against the skin with adhesive tape. The patient feels nothing, not even a needle prick.

Science News Letter, March 25, 1950

PHYSICS

Californium Element 98

➤ CREATION of the 98th and heaviest chemical element through atomic bombardment in the University of California 60-inch cyclotron has been made known.

It has been christened californium, honoring the university and state where the six heaviest trans-uranium elements, including plutonium, have been manufactured and discovered in the past decade.

Production of minute and fast-disappearing quantities of the new element 98 follows close upon the announcement of element 97 last January.

The team of scientists engaged in Atomic Energy Commission research which produced californium included Dr. Stanley G. Thompson, Kenneth Street, Jr., Albert Ghiorso, and Dr. Glenn T. Seaborg, with Dr. Joseph G. Hamilton making the bombardments with alpha particles of the isotope 242 of curium which was transmuted into the new element.

Living only a short time before it decays by emitting an alpha particle half of an amount of californium will disappear in 45 minutes.

The amount of californium so far made is infinitesimally small, since the bombarded curium, itself very rare, weighed only a few millionths of a gram. The identification of the new element was based on its chemical separation and its predicted half-life.

No use for the new element is suggested, except that it adds a chemical building block to the universe. It cannot be used for bombs or power.

Californium has a place in the actinide series of elements that corresponds to dysprosium, element 66, in the lanthanide series. It has been customary to name the members of the two series in a similar way. Dysprosium means "hard to get", so Dr. Seaborg, leader of the element-discovering group, explains that California was hard to get to about a century ago in the gold rush days.

Element 97 was named berkelium, in honor of the city of Berkeley.

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PHYSICS

Missile's Speed in Water

See Front Cover

➤ COULD a missile such as a torpedo travel at supersonic speeds through water? The Navy is trying to find out.

Naval ordnance experts revealed they have fired small steel balls into water at speeds up to 7,000 feet per second (more than 4,770 miles per hour). Sound in cold water travels approximately 5,000 feet per second, nearly five times as fast as in air.

Shown on this week's cover of SCIENCE NEWS LETTER is a picture of what happens to a small steel pellet, moving along at 6870 feet per second, more than 4500 miles an hour, when it strikes the water.

This photograph is actually a shadowgram of the entry into water of a one-eighth inch steel sphere. It shows the straight shock waves in the air, and the semicircular shock waves in the water stirred up by such high speeds. The central cavity and the splash created when the sphere entered the water can be seen, but the sphere itself is hidden behind the shock front at the lower end of the cavity.

The Navy's pellets slow down fast. A decelerating force 2,000,000 times the force of gravity has been tabulated, Dr. J. Howard McMillan of the Naval Ordnance Laboratory in White Oak, Md., indicated. Scientists call the force of gravity "g". When a diving plane pulls out sharply, pilots sometimes experience a force nine or 10 times the force of gravity.

At White Oak the Navy has opened a new laboratory devoted to scientific destruction of its own weapons.

More than 500 top scientists and military leaders were invited to see the new $4,000,000 installation. From submarines to gun projectiles, naval weapons will be strained and battered under exaggerated field conditions. Savings in government development work in millions of dollars are expected.

A giant pressure tank will be able to subject midget submarines to half-mile-deep pressures. High speed movie cameras will record what happens to tiny models of torpedos, mines and depth charges when they enter the water at tremendous speeds. An air gun 100 feet long can simulate the impact of a torpedo striking a ship or the jolt on a fuse fired from a gun.

Under Secretary of the Navy Dan A. Kimball dedicated the new Ordnance Environmental Laboratory on March 23. It was part of a two-day Armed Forces National Shock and Vibration Symposium in Washington.

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CHEMICAL ENGINEERING

Waves Remove Fine Dust, Chemical Mists from Gases

➤ PURE air and pure water received the attention of the American Institute of Chemical Engineers in Houston, Texas. Air and gas purification and waste disposal to prevent water pollution were number one subjects on the program.

Sonic dust and mist collection was discussed by Harold W. Danser, Jr., Ultrasonic Corporation, Cambridge, Mass. Fine particles suspended in a gas are caused to vibrate, collide, adhere and agglomerate together as the gas travels for a few seconds through a vessel in which is created a sonic field of high intensity.

The sonic field contains sound waves of the type too high in pitch to be recognized as sound by the human ear. These so-called ultrasonic waves are now being used for many purposes ranging from killing bacteria in milk to cleaning clothes.

Sonic agglomeration, he said, permits the collection of fine particles whose mass is otherwise too light to permit their ready collection by customary cyclones or separators used in removing larger, heavier particles from gas.

Sonic collectors were described which have been used successfully for the recovery of sulfuric acid fog, carbon black and oil mist.

Equipment for generating ultrasonics was described by W. H. Janssen, General Electric, Schenectady, N. Y. Even though the art of generating ultrasonic energy is not new, developments stimulated by World War II have resulted in increased activity in the field, he stated.

Pollution abatement and industrial water management was the subject of discussion of C. F. Hauck, Hall Laboratories, Pittsburgh, Pa. For lowest total water costs, industrial waste problems must be studied with full consideration for the many interrelationships among problems of water procurement, usage and disposal.

Science News Letter, March 25, 1950

GENERAL SCIENCE

Gov't Bureaus Attack Bill

The Department of Justice and FBI hit the provisions written into the Science Foundation Bill as perilous to not only the Bureau but the entire country.

➤ THE Department of Justice and the Federal Bureau of Investigation, with the concurrence of the Secretary of Defense, have attacked the unprecedented loyalty provisions written into the National Science Foundation bill as "fraught with peril, not only to the Bureau itself, but also to the country at large."

The letter was written to Sen. Elbert Thomas (D.-Utah) and Rep. Robert L. Crosser (D.-Ohio), chairmen of the Senate and House Committees handling the bill, by Peyton Ford, Assistant to the Attorney General.

Mr. Ford, speaking for the Justice Department, the FBI and the Secretary of Defense, referred particularly to two amendments introduced by Reps. Howard W. Smith (D.-Va.) and Daniel J. Flood (D.-Pa.). The Smith amendment would require the FBI not only to investigate all prospective employees and scholarship-holders but also to make a judgment as to whether they were loyal and to certify that they were not or never had been members of subversive organizations. The Flood amendment would have required the FBI to make investigations and judgments as to any aliens receiving money from the Science Foundation.

Mr. Ford's letter pointed out that the FBI is "solely an investigative and fact-finding agency; it does not evaluate or make recommendations with reference to the information it collects."

"The fine reputation which I believe the Bureau enjoys," Mr. Ford went on, "results in large part because it has carefully restricted its activities to the making of investigations.

"In the opinion of the Director of the FBI, with which I agree, such legislation would constitute a clear departure from accepted fundamental theories of American government and lay a foundation for criticism of the Bureau as a state police organization."

Mr. Ford pointed out that membership "at any time" in subversive organizations was only a part of the evidence considered in a loyalty investigation. He said such a provision "seeks to deny to the Foundation the services of many Americans of unquestionable loyalty to the United States and its form of government who innocently joined a so-called 'front' organization with the highest motives and who withdrew their membership from such organization upon their first suspicion of its subversive character."

"It is characteristic," Mr. Ford continued, "of many 'front' organizations that their purported purposes and program are designed to appeal to loyal Americans."

The present loyalty program, Mr. Ford said, enables an employee who is a member of a listed organization to respond to charges against him and to show that his membership is innocent and does not reflect upon his loyalty. This opportunity, he said, "to defend himself in a manner consistent with American concepts of justice and fairness is lacking from the amendments."

In regard to the amendment having to do with aliens, Mr. Ford pointed out that the FBI has no facilities for conducting investigations abroad.

Mr. Ford concluded by asking that every effort be made to strike out the two amendments before its final enactment, "thus leaving investigations of the personnel of the National Science Foundation to be conducted on the same basis as investigations of personnel of other non-sensitive agencies."

Science News Letter, March 25, 1950

ZOOLOGY

Insect Vision Clue

➤ THE lowly, spiny-tailed horseshoe crab has a delicate compass in his bulbous eyes. It is affected by polarized light.

This discovery was reported recently by a Yale University zoologist, Dr. Talbot H. Waterman. It could give scientists a clue to the ability of high-flying insects to "see" their way to distant points by invisible polarization of light.

Dr. Waterman found that the compound eye of the horseshoe crab, which is similar to that of many insects, is affected by even a slight change in light polarization.

The zoologist hooked a loudspeaker to nerves leading from the crab's eye, among other instruments used in the intricate experiments. Then he listened to electrical impulses produced when a pinpoint of polarized light was shone into the eye.

How the crab uses his light compass is still not known, Dr. Waterman says in SCIENCE (March 10).

Science News Letter, March 25, 1950

***FOR NUCLEAR RESEARCH**—Michael Karelitz, engineer, studies automatic sample devices used for neutron experiments at the new Columbia University nuclear physics research center at Irvington-on-Hudson. Three years and one month after construction began, the world's most powerful synchro-cyclotron, generating 385,000,000 electron volts, is now in operation.*

ARCHAEOLOGY

Earliest Murder Trial On Record Disclosed

➤ THE earliest murder trial on record was described by archaeologists in Philadelphia recently.

The University of Pennsylvania and the University of Chicago announced jointly that a clay tablet unearthed in Iraq, where the ancient city of Nippur stood 4,000 years ago, is the oldest known record of a successful murder prosecution.

The date was about 1850 B.C. Three men and a woman were tried by a democratic court of justice for the murder of a temple official. The men were condemned to die before the murdered man's chair. The woman, his wife, was set free.

The tablet describing the trial was dug up by members of a joint archaeological expedition of the two universities. Written in the ancient cuneiform script and Sumerian language, it was translated by Dr. Thorkild Jacobsen of the University of Chicago and Dr. Samuel N. Kramer of the University of Pennsylvania Museum. Only a dozen-odd scholars in the U. S. can read this oldest known form of writing.

Science News Letter, March 25, 1950

AERONAUTICS

Pilot Error Top Cause of Personal-Plane Accidents

➤ "PILOT error" was the cause of 758 fatal aircraft accidents in private flying during 1948, according to the U. S. Civil Aeronautics Board, but the term covers errors in judgment as well as bad operation.

The conclusions of the Board are based on investigations made of the 850 fatal accidents of private planes in the United States during 1948. Private flying is what the Board calls non-air-carrier flying. Approximately 90% of the total, it states, were the result of "pilot error."

"Operating recklessly" was the cause of 41% of the 758 accidents, the report of the Board shows. "Failure to maintain flying speed" was the cause in 18.6% of the cases. "Continued Visual Flight Rules" into instrument weather was responsible in 14.9% of the fatal failures. These three causes together add up to approximately 75% of the 758 accidents.

In the list of pilot errors are three which together caused about 12% of the accidents. They are failure to observe aircraft or objects, misjudged distance, and improper flight training or supervision. Other errors include exceeding the stress limits of the plane, inadequate flight preparation, and inattention to fuel supply and valves. Several other causes are listed but the number of accidents caused by them was small.

In the three categories which include 75% of the accidents, plane stalling was involved in 60% of the cases. "It is this high frequency of stalls in fatal accidents which indicates that the designer can do more than anybody else to reduce the fatal accident rate in personal craft," the report states.

"We do not have sufficient exposure data to evaluate the stall warning indicator from the standpoint of accident prevention," the Board continues. "We feel, however, that a good stall warning indicator can do much in helping pilots to keep existing aircraft out of stall accidents. Also, we believe that the stall warning indicator is a valuable flight instrument which can help any pilot to learn the limitations of his aircraft."

Science News Letter, March 25, 1950

GEOLOGY

Elephant Story from Africa: Elephants Know Their Rocks

➤ OUT of Africa have come many elephant stories, but here is one that is down to earth and told by a geologist.

Elephants know their rocks, evidently, and they roam by preference on the sandstone part of the country and avoid the granite areas.

Dr. Herbert P. T. Hyde, of the Nigeria Geological Survey at Enugu, reporting to the British journal, NATURE (Feb. 25), tells of three instances, in three separated areas, where the elephants were observed to stick to the sandstone areas.

So pronounced is the preference of the elephants that the boundary line between two geological formations can be deduced from asking the natives how far the elephants circulate in the district.

Dr. Hyde is at a loss to explain the preference, except that it may be a question of food, chemical composition of the water or nature of the weathering soil.

Science News Letter, March 25, 1950

MEDICINE

Virus X Either 'Flu or Unknown Germ or Virus

➤ YOU may think you are down sick with virus X, and a good many physicians are heard talking about virus X. But so far as the U. S. Public Health Service is concerned, there is no virus X disease.

Virus X victims either have influenza or they have a stomach and intestinal upset from some still unidentified germ or virus, public health officials state.

A good many outbreaks of so-called virus X disease have been investigated and tests made. It always turned out to be influenza.

The g. i. upsets—g. for gastro, meaning stomach, and i. for intestinal—used to be called intestinal 'flu. What causes them seems so far to be anybody's guess. It is not the influenza virus.

Science News Letter, March 25, 1950

IN SCIENCE

ENGINEERING

Volume, Density of Snow Measured

➤ VOLUME and density of hard-packed snow is quickly determined by a new, simple instrument revealed at the Army Engineer Research and Development Laboratories in Fort Belvoir, Va.

It is designed for use in extremely cold countries where there is a military interest in snow as a construction material in the snow engineering of roads, aircraft runways and other Arctic projects. The device can also be used in soils testing. Its development is the work of John E. Shea, a civilian project engineer.

The new instrument is called a Volumeter. It utilizes air displacement. Consisting basically of two air-tight chambers separated by a valve, the instrument is simple to operate and provides a method more satisfactory than other methods now in use.

For determining absolute volume, a sample is put in the upper chamber of the instrument, the chamber sealed, and air at 15 pounds per square inch pressure pumped in. Then the valve between the chambers is opened and the pressure drop noted on a gage. By extension of Boyle's gas law, a relationship between the volume of the sample and pressure may be established. In the instrument, direct volume readings are given without the need of calculations.

For density determination the process is similar except that the sample is put in a rubber balloon fitted to the neck of the upper chamber. By air escape the balloon collapses tightly around the sample. Following the same procedure as in determining volumes, the connecting valve between chambers is opened, and the apparent volume of the sample is read on the gage. Dividing weight by volume gives the density.

Science News Letter, March 25, 1950

PSYCHOLOGY

Pleasurable or Painful Emotions Affect Sleep

➤ SEEING an emotion-arousing motion picture or worrying about an examination on the next day may both make a school child's sleep troubled and restless, Dr. Glenville Giddings, Atlanta physician, warned.

"Emotions, whether pleasurable or painful, interfere with normal sleep," he reported to a joint committee of the National Education Association and the American Medical Association.

Science News Letter, March 25, 1950

E FIELDS

PSYCHOLOGY

Proposing Marriage Ideal Stuttering Starting Point

➤ DID you ever propose marriage or ask the boss for a raise? Then you have a pretty good idea how habitual stutterers got their start.

So says Dr. Joseph Sheehan of the University of California at Los Angeles who is helping to develop a speech correction clinic at U.C.L.A.

Most stuttering, he says, has its roots in an "approach-avoidance" conflict. This simply means a conflict between a desire to go ahead and an urge to hold back for fear of the consequences.

Typical "approach-avoidance" conflicts—such as a marriage proposal or a demand for a raise—generally provoke a certain amount of stuttering among people with normal speech habits, Dr. Sheehan notes.

Habitual stutterers, therefore, are basically no different from those who handle the King's English with assurance and aplomb. In most cases, however, their speech defects start much earlier—usually between the ages of three and five.

Dr. Sheehan's patients learn, first of all, to face their problem and overcome any feelings of shame or inferiority. Accepting the fact that they do have a handicap and that they are trying to overcome it is the basis on which stuttering can be treated.

Although Dr. Sheehan works primarily with adult stutterers, the best time to catch stuttering is when it begins in childhood.

Science News Letter, March 25, 1950

BOTANY

Yocco, Jungle Drink, Cuts Hunger, Fatigue

➤ THE pause that refreshes for jungle tribes of the upper Amazon is a drink called yocco (rhymes with cocoa).

Smithsonian Institution scientists recently described this strange beverage. They said it is non-intoxicating. But it can forestall both hunger and fatigue for hours.

Specimens of the jungle vine from which yocco is made have been sent to the Smithsonian's National Herbarium by Dr. Richard E. Schultes, U. S. Department of Agriculture plant explorer.

"I have made long trips through the forests and, taking nothing but yocco, have felt neither fatigue nor hunger," he says. Similar descriptions of the drink have been found in the notes of an earlier explorer, Guillermo Klug.

A very high caffeine content gives the drink its punch, botanists say. Yocco vine seems to concentrate caffeine in the bark.

Americans who want yocco will have to go to southeastern Colombia, however. The vine couldn't be grown naturally in the United States, Dr. Ellsworth P. Killip, Smithsonian Curator of Botany, said.

Even in the Amazon valley there is a shortage. The Indians like it so much the wild plants are becoming scarce near the settlements.

Science News Letter, March 25, 1950

GENERAL SCIENCE

Children Involved in 42% of Divorces

➤ DIVORCE in families with children is more common than is generally realized, statisticians of the Metropolitan Life Insurance Company point out.

Almost half, 42%, of all divorces and annulments granted in the United States in 1948 were to couples with children.

About 313,000 children under age 21 were involved in the 421,000 absolute decrees granted that year. These plus their parents made a total of almost 1,200,000 persons in families dissolved by divorce.

The difference in the divorce rates between couples with and without children varies according to the duration of the marriage. For those with children the peak divorce rate, 15 per 1,000 in 1948, was reached in the fourth year of marriage. In childless families that rate reached a maximum of 44 per 1,000 couples in the fifth year of marriage.

Science News Letter, March 25, 1950

GEOLOGY

Niagara Falls Losing Its Horseshoe Shape

➤ THE famous "horseshoe" part of Niagara Falls is being bent out of shape by erosion. The United States Geological Survey has just issued a new map of the falls region, and a comparison with the old map issued 50 years ago shows that the curve of the horseshoe has moved 300 feet up the Niagara River and warped over to the right.

The two maps show that there has been much less erosion of the American falls, which takes only five per cent of the river's water. However, where those falls were straight across 50 years ago, now a slight dip has been eaten into the middle.

This doesn't really matter much because, the two maps show, in another 350 years or so, there won't be any American falls. If erosion of the Canadian horseshoe falls continues at the same rate, about the year 2300 they will be in a position to take all of the river's water.

The new large-scale map of the Niagara Falls area was made on a cooperative basis, with the New York State Department of Public Works augmenting federal funds. It is on a scale of one inch to 2,000 feet.

Science News Letter, March 25, 1950

FORESTRY

Wilt Disease Threatens Forests of Midwest

➤ A TREE disease known as oak wilt threatens to kill whole forests of the valuable hardwood in Illinois, Wisconsin, Minnesota and Iowa.

It has run rampant through northern Illinois since its first appearance eight years ago. A map released by the Department of Agriculture's Division of Forest Pathology shows it now has spread westward through a 300-mile arc.

Illinois State foresters report the wilt is killing oaks in a single growing season. They say it can prove a "major disaster" for Chicago residents who use recreational areas in northern Illinois oak forests.

The disease has infiltrated the entire southern half of Wisconsin and the southeastern corner of Minnesota. University of Minnesota scientists report it is killing large numbers of oaks near the Twin Cities, St. Paul and Minneapolis.

Science News Letter, March 25, 1950

AGRICULTURE

Increased Yields Promised From Hybrid Sugar Beet

➤ GREATLY increased yields of sugar beets are promised from a hybrid seed developed in East Lansing, Mich.

This new hybrid seed will do for the sugar beet farmer what hybrid corn did for the corn farmer.

The new seed, known as Hybrid 125, was developed by H. L. Kohls of Michigan State College. His development grew from a discovery made by Dr. F. V. Owen, a geneticist with the U. S. Department of Agriculture.

Dr. Owen found that the new sugar beets could be bred through use of plants that do not have the ability to produce pollen. Pollen from other plants is used to give hybrid sugar beet seeds that can be bred. These hybrids may give higher yields as well as increased disease resistance.

The new hybrid sugar beet is being grown in limited quantity now, and small amounts of seed are expected to be available to farmers in 1951. The hybrid variety carries about the same resistance against leaf spot as do commercial varieties, and also produces a beet of about the same sugar content.

Flowers that are perfect pollinate themselves. If they are not perfect the pollen comes from some other source. When a sugar beet is male-sterile, it will not pollinate itself but the proper cross-pollination will yield a seed that is 100% hybrid. The discovery of this male-sterility characteristic thus opened the way to production of 100% hybrid seed. Previously this had not been possible.

Science News Letter, March 25, 1950

ASTRONOMY

Mercury Visible at Twilight

Mars and Saturn are also in the evening sky in April. A total lunar eclipse, not visible from any part of North America, will occur.

By JAMES STOKLEY

➤ OF the eight major planets that, together with the earth, revolve around the sun to form the solar system, the outer three—Uranus, Neptune and Pluto—are too faint to be seen with the naked eye. Generally Mercury, the innermost, is also invisible, but for a different reason, since its brightness is ample. However, its mean distance from the sun is only 36,000,000 miles. It never gets very far away from the sun's direction, and is usually hidden in that body's glare. Every 116 days it swings around to the same side of the sun as the earth, and twice in this period it is seen farthest from the sun, as we see these bodies in the sky. When farthest west, it appears in the east before sunrise. When it is farthest to the east, at "greatest eastern elongation," it is an evening star, visible after sunset. That event occurs in April. It will afford the best opportunity of 1950 to see Mercury in the evening. There will be other eastern elongations in August and December, but the springtime ones are the best.

The actual greatest elongation occurs on April 22, at 9 p.m., E.S.T., but from about the 20th to the 27th there will be little change. At sunset Mercury will be well above the western horizon. As dusk gathers, and the sky becomes darker, the planet will appear in the twilight. It will have set by the time it is completely dark, but one should have little difficulty in finding the planet, since there is nothing else in that region with which it may be confused. Of course, in looking for it one should select a position where there is a clear view to the west, and the sky will have to be clear, even down to the horizon.

The accompanying maps show the heavens as they appear about 10 p.m., your own kind of standard time, at the first of April, and an hour earlier in the middle of the month. Mercury does not appear on them, but two other planets are shown. These are high in the southern sky. Brighter of the pair is Mars, which shines brilliantly in the constellation of Virgo, the virgin. Its magnitude, on the scale used by astronomers, is minus 0.8. Saturn, less than a quarter as bright and of magnitude plus 0.8, is a short distance to the right, though across the boundary in the next-door constellation of Leo, the lion. Each of these constellations contains a star of the first magnitude, Spica, in the case of Virgo, and Regulus, in Leo. The latter is at the end of the handle of a smaller group generally called the sickle from its shape.

Sirius Is Brightest

Brightest star, however, that is shown on the maps, is Sirius, the dog star, in Canis Major, the greater dog, toward the southwest. Above it is Procyon, in Canis Minor, the lesser dog. Near Sirius, toward the west, is Betelgeuse, in Orion. So prominent in the winter sky, this group is now sinking lower and lower, and shortly will be gone from view. To the right of Orion we see Taurus, the bull, with Aldebaran, though when as low as indicated it looks much fainter than when it is higher. Above Orion is Gemini, the twins, with Castor and Pollux, the latter of the first magnitude. A little farther north, and lower, is Auriga, the charioteer, in which the bright star Capella shines.

Above Virgo is Bootes, the bear-driver, with another bright star, Arcturus. Extending above and toward the left is the great dipper, now upside down, and part of Ursa Major, the great bear. Lower down is Polaris, the pole star, in Ursa Minor, the lesser bear. This is also part of the little dipper.

The other two naked eye planets, Venus and Jupiter, are visible during April in the eastern sky before sunrise. Both are in the constellation of Aquarius, the water-carrier. Venus, to the west of Jupiter at the beginning of the month, is moving in an easterly direction and passes her big brother planet on the twelfth. After that Jupiter is to the west, and rises first, about two hours ahead of the sun. Venus is by far the brighter, of magnitude minus 4.0. This is more than eight times as bright as Jupiter though even that planet exceeds in brilliance any of the other planets, or stars. On April 11 Venus is farthest west of the sun. After that date Venus starts moving towards it, getting fainter and fainter at the same time, until next autumn it will be gone from the early morning sky.

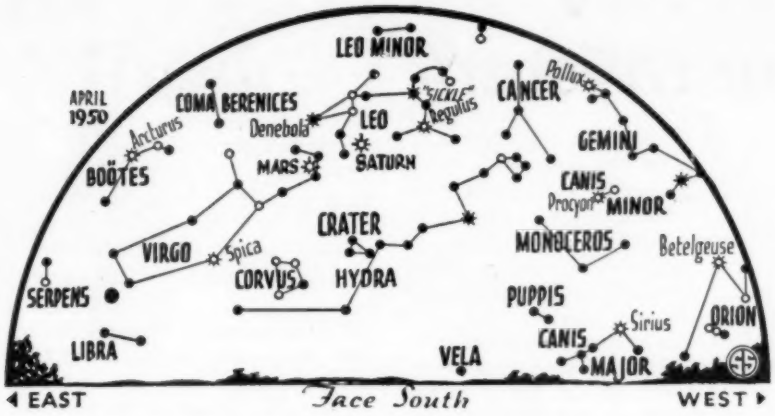
Asteroid Icarus Closest to Sun

The last time we had occasion to discuss Mercury in one of these articles, we said that it was the nearest planet to the sun. This is still true, as far as the nine major planets are concerned, but only last year Dr. Walter Baade, at the Mt. Wilson Observatory, discovered a new asteroid, or minor planet, which comes even closer. It has been given the very appropriate name of Icarus, after the mythological boy who flew too close to the sun. His wings, the invention of his father, Daedalus, were held on by wax, which was melted by the hot solar rays, so that he became one of the first air casualties.

The asteroid Icarus, probably less than a mile in diameter, can come as close to the sun as 17,000,000 miles. The closest that Mercury may get is 28,600,000 miles. For a major planet, Mercury's orbit is very elliptical, since its greatest distance from the sun is 43,400,000 miles, but that of Icarus is stretched out to a far greater degree. When farthest from the sun its distance is about 180,000,000 miles, even farther out than Mars. The mean distance of the earth, incidentally, is about 93,000,000 miles.

Revolution of Mercury

As for Mercury itself, the planet revolves around the sun once in 88 days. However, as it does so the earth, which takes 365 days to complete its circuit of the sun, has gone about a quarter of the distance around, and thus Mercury has to go still farther to catch up to us. Thus it is that 116 days are required to bring it around to the same



☼ ✷ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

direction from the sun that we are, i. e., to the position called "inferior conjunction."

Mercury is much smaller than the earth, with a diameter of 3100 miles compared to our 7918 miles. Because of its smaller size, gravity on the surface of Mercury is less than a third of what we experience. A man of 200 pounds here would weigh only 58 pounds on the surface of that planet.

Mercury Not Resort Material

However, even if some day men are able to travel by rocket ships to other planets, it is hardly likely that Mercury will be a very popular resort. Like our moon, it seems practically devoid of any atmosphere. In a manner similar to that in which the moon always keeps the same face turned towards the earth, so does Mercury always keep one hemisphere directed toward the sun. With the sun so close and always shining, the temperature of this part of the planet is about 650 degrees Fahrenheit, hot enough for lead to melt. On the opposite face, which never receives any sunshine, it must be extremely cold. In between these regions there is a narrow zone in which the sun occasionally rises a short distance above the horizon, then drops behind it again. Though the average temperature here would have a more reasonable figure, it would still be subjected to great extremes, and hardly a comfortable place to be.

Eclipse of Moon

Another item on the astronomical program for April is a total eclipse of the moon, but it will not be visible from any part of North America. From Europe, Asia, Africa and Australia the beginning will be seen, while the end, which will not be seen from Australia, will in addition be observed from the east coast of South America. Any disappointment that we may feel is ameliorated by the fact that the year will bring another total lunar eclipse on Sept. 26. Then, as in the case of the two lunar eclipses of 1949, practically all of North America will be able to see it.

Time Table for April

April	EST	
1	6:37 p. m.	Moon passes Mars
2	3:49 p. m.	Full moon (total eclipse visible from Europe, Asia and Africa)
3	3:00 p. m.	Moon nearest distance 222,900 miles
5	6:00 a. m.	Venus passes Jupiter
6	4:00 a. m.	Neptune nearest, but still invisible to naked eye, distance 2,721,000,000 miles
9	6:42 a. m.	Moon in last quarter
11	4:00 a. m.	Venus farthest west of sun
12	7:46 a. m.	Moon passes Jupiter
	7:59 p. m.	Moon passes Venus
17	3:25 a. m.	New moon
18	2:00 p. m.	Moon farthest, distance 252,500 miles
21	early a. m.	Meteor shower visible, radiating from constellation of Lyra
22	9:00 p. m.	Mercury farthest east of sun, visible around this date in west just after sunset
25	5:40 a. m.	Moon in first quarter
28	1:42 a. m.	Moon passes Saturn
	5:55 p. m.	Moon passes Mars

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, March 25, 1950

NUCLEAR PHYSICS-GEOLOGY

Age of Uranium Deposits Clue to Their Location

➤ HOW old are U. S. uranium deposits? Government experts reported that the age of radioactive ores may be a key to how they are formed, and more important, where to look for them.

U. S. Geological Survey analysts L. R. Stieff, M. N. Girhard and T. W. Stern in reporting preliminary tests on Colorado carnotite, a source of uranium, have given widely divergent answers: anywhere from 30,000,000 to 600,000,000 years.

The real answer is believed to be under 100,000,000 years, they said. But something has happened to the deposits as the earth's crust formed. Hence different laboratory tests have given different results.

The real age of such deposits may throw light on the origin of radioactive elements and guide prospectors in more systematic exploration.

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MEDICINE

Human Pregnancy Detected Earlier by New Test

➤ A SPEEDY test for detecting pregnancy at an early date and which also helps predict whether the pregnancy will be normal or end in spontaneous abortion is reported in the first issue of a new scientific journal, FERTILITY AND STERILITY (Jan.).

The test was devised by Dr. Edmond J. Farris of the Wistar Institute, Philadelphia. It is done with rats. Results of the test are known within 24 hours. The test detects pregnancy as early as the 31st day of the menstrual cycle, whereas the 43rd day is the earliest for other tests. This means the patient and her physician can know whether she is pregnant about two weeks earlier than by other tests.

Redness of the ovaries of the immature white rat 24 hours after a few drops of the woman's urine has been injected under the rat's skin tells whether she is pregnant. The degree of redness is important. A strong color indicates a normal pregnancy. A weak color reaction suggests that the woman will lose the baby by spontaneous abortion.

Certain nonpregnancy conditions, such as ovulation and the menopause, will also produce the red color reaction. But in these conditions the reddening of the rat's ovaries is at its maximum within two hours, whereas pregnancy does not produce its greatest reddening for 15 to 24 hours later.

Science News Letter, March 25, 1950

Telephone Shoulder Cradle

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GENERAL SCIENCE

The Flying Saucer Mystery

➤ THE flying saucers that are again being reported as being seen around the country and in Mexico are most likely:

1) The planet Venus, now extremely brilliant in the morning in the southeastern sky. Venus is easily visible before the sun rises, but it can be seen throughout the day. It is two and one half hours ahead of the sun, that is, it rises a little after 4:00 a.m. E.S.T. At the present time Venus is almost as bright as it can get, more than four times the brightness of the closest star.

2) Balloons, either cosmic ray or weather balloons. Cosmic ray balloons can go at least as high as 18 or 20 miles. Some of them are big enough, 75 feet at their highest altitude, to be seen with the unaided eye. Weather balloons, though not quite so big, can also go to about the same height and could also be seen easily.

3) Meteors, sometimes known as shooting stars or fireballs. These small celestial bodies are invisible except when they enter the earth's atmosphere. Then they are heated by the impact of air and appear as streaks of light across the sky. Unusually brilliant meteors are called fireballs.

4) Radio-controlled jet or rocket aircraft being secretly tested. Scientists familiar with aeronautical research trends do not entirely discount the reality of the strange flying disks despite Army and Navy disclaimers of such flights.

5) A mild form of mass hallucinations.

6) Actual disks. Some kind of a secret device being tested by the armed forces. Possibly this could be used either to test the effectiveness of our radar screen or to foul up the detecting of objects in the sky by radar in a manner similar to that accomplished by aluminum foil, or window, during World War II.

A possible explanation of the reports of visits of flying saucers containing men from other worlds is that of wishful thinking. Some people who are worried about the state of the world today believe that the most likely way of settling differences would be to unite all countries of the world against a common aggressor. The reported "men from Mars" would solve this problem nicely.

Science News Letter, March 25, 1950

PSYCHIATRY

Best Truth Serum Yet

➤ SOMNOFORM, an inhalant anesthetic used for some 25 years by dentists, has been tried out as a "truth serum" and found to be superior to any so far investigated.

Indeed, somnoform is nearly perfect as a truth serum, reports Dr. Douglas M. Kelley, psychiatrist of the Nuremberg trials and now professor of criminology at the University of California, in the AMERICAN JOURNAL OF PSYCHIATRY.

Dr. Kelley selected Somnoform after writing the specifications of the perfect truth serum, and then making a systematic search of all known drugs which might fill the bill.

Such drugs release inhibitions, making it possible for mentally disturbed individuals to remember and talk freely about painful incidents of the past which the patient involuntarily cannot recall and which may be the cause of the ailment. Amnesia is a typical disturbance in which truth drugs are helpful. Such drugs are also useful in detecting willful deception by criminals, a field in which Dr. Kelley is currently working.

The psychiatrist said that Somnoform, used in about two million cases in dental practice without a fatality, is administered through a face mask attached to a collapsible rubber bag. The drug comes in an ampule, which is broken when put into the bag, gentle pressure on the bag forcing the gas into the mask.

Dr. Kelley has used the gas on 38 patients, with no serious side effects or after-effects. Use of the gas permits interviews up to as long as a half hour.

He cited examples of the use of the gas, including those of a girl of 18 with amnesia and a war veteran suffering from an anxiety state. He is also using it in research with criminals.

Dr. Kelley is one of the pioneers of the use of truth drugs. He applied them successfully in the treatment of mentally disturbed soldiers fresh from the battlefields of World War II.

Truth drugs commonly used include sodium pentothal and sodium amytal, administered by injection, and nitrous oxide and ether, both gases.

The psychiatrist said Somnoform eliminates the fears of many patients of injection needles; it is easy to handle in an office situation; and it produces neither nausea nor the extreme excitability characteristic of some of the other drugs. About the only situation in which it is not superior to the others, he maintains, is in cases requiring long sleep after psychiatric interview, when sodium pentothal is used.

Science News Letter, March 25, 1950

Words in Science—CEMENT-CONCRETE

➤ CEMENT is any finely powdered substance which acquires strong adhesive powers when mixed with water. Portland cement, so named because it resembled a building stone quarried on England's Isle of Portland, is the most important.

It is made wherever natural raw materials most closely approximate the desired chemical composition: a mixture of the oxides of calcium, aluminum, silicon, iron, magnesium and sulfur. Limestone and clay, cement rock, marl, slag or iron ore are ground, heated in rotating kilns until they fuse, then ground again.

Mixed with sand and crushed stone, plus water, cement locks these aggregates of concrete into a rock-solid mass which withstands the ravages of weather and wear. You will find concrete in buildings, bridges, dams, retaining walls and highways.

Science News Letter, March 25, 1950

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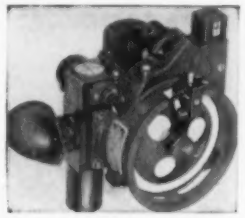

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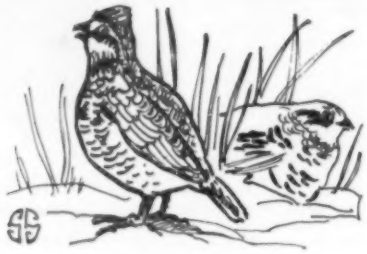

Bobwhite

➤ BOBWHITE is a bird that stays put. He likes it where he is and he doesn't squander a wing-beat on migration. Winter or summer, hot or cold, bobwhite rarely strays outside a ten-mile radius of his native hatch.

This speaks well for the hardiness of the bird, for like other quail and partridges of the Perdicidae family bobwhites nest on the ground. They usually find a sheltered place like a depression in the grass or at the base of a tree or bush to make their nests of grass and stems.

In these snug sanctuaries families of bobwhites huddle together with no apparent discomfort from the winter's worst weather. The greatest hazard of overwintering from the bobwhite's point of view is too much snow. Bobwhites feed on seeds and berries, and as long as the snow does not cover up the total available supply, they manage nicely.

Bobwhites are small birds, averaging about ten inches in length. Their bills are short and thick, their feet are strong and well adapted to scratching. Distinctive features are a white line over the eye, a white throat, and a white under-body barred with black. The overall coloring is reddish brown, with a gray tail.

If you were to ask whether the bobwhite is a quail or a partridge, the answer would depend on the part of the country you were in. In the East, the name quail is used interchangeably with bobwhite: bobwhite is quail and quail is bobwhite. In the South bobwhite is called partridge. To complicate matters further, the ruffed grouse which belongs to a distinct family is referred to as a partridge in New England.

The name bobwhite comes from the distinctive and easily imitated call, which is a musical phrase whistled cheerfully, usually from atop a post, bush, or rock. If you are willing to meet the bird halfway, you can distinctly hear him calling "bob-white, poor-bob-white," with the last note rising sharply.

That the precise meaning of the bird's call lies chiefly in the ear of the listener is borne out by the fact that in New England it is said that the bobwhite's call is a weather forecast. If the two-note call is sounded, he is issuing a warning, "more wet." If instead he utters the three-note whistle, he is predicting, "no more wet."

The small cheerful bird does man a valuable service as a weed-killer. Bobwhites have a great appetite for weed seeds. They consume great quantities of ragweed, pigweed, and foxtail grass seed and other unwanted weed varieties.

Science News Letter, March 25, 1950

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AERONAUTICS

Self-Starter Eliminates Ground Power Aid Need

➤ A NEW self-starter system, for gas turbine propelled aircraft, makes possible an unlimited number of starts without aid from any ground power. This is one of the features of a pneumatic auxiliary power system, developed by AiResearch Manufacturing Company, Los Angeles.

Another feature is that it provides independent operation of necessary accessories when the main turbine power plants are idle. A plane equipped with it can maintain heat, light, radio communication and all necessary accessory activities without operating the main engine. In flight, it will give constant power for accessories regardless of the varying power output of the main engines.

This auxiliary power system was developed by AiResearch under the sponsorship of the Navy Bureau of Aeronautics and Consolidated Vultee Aircraft Company. The primary purpose was to find an airborne self-starter for jet planes to free them from dependence on ground power. The use of this device will permit the sudden shifting of jet planes to strategic airfields where a source of ground power is not available.

The AiResearch pneumatic system consists basically of two small gas turbine compressors, two air turbine alternator drives and four air turbine starters. Reduced to the simplest terms, the operation of the system can be likened to a wind mill. The driving force, compressed air, is supplied by the gas turbine compressors. They are said to be the most powerful air suppliers for their size in the world.

The compressed air is carried by ducts to the air turbine alternators and air turbine starters. Striking the turbine blades in these units, it windmills them up to speeds above 30,000 revolutions per minute. The alternators provide the means of transferring power from the system to operate accessories. The starters crank up the gas turbine engine.

Science News Letter, March 25, 1950

ENGINEERING-AERONAUTICS

Match-Head Size Radio Tube Lightens Equipment

➤ A RADIO tube the size of a match head is in experimental development at the Wright-Patterson Air Force Base, in Dayton, Ohio, it was revealed recently. It would take 90 of them to equal in volume the well-known standard radio tube.

About 250 of them have been made and are under test. There are still "bugs" to be eliminated, and production methods will have to be developed. The present tubes are hand-made and, therefore, necessarily costly.

The name of the new sub-miniature tube is the "fieldistor." It offers important advantages from a weight and space standpoint. Possible adaptation of the small tube to civilian usage is seen in such items as radio, television, hearing aids, fire and burglar alarms and in thermostats.

Modern aircraft uses hundreds of radio tubes for various purposes. The space and weight saved by the use of these tiny tubes means longer aircraft range at reduced operating expense, officials state.

Another advantage of these tubes is that they withstand engine vibration, gunfire and landing shock which literally destroys many conventional tubes. Also, the new tube uses so little current that many of the batteries now necessary can be eliminated.

Science News Letter, March 25, 1950

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publications direct from issuing organizations.

AIR CONDITIONING AND REFRIGERATION—Burgess H. Jennings and Samuel R. Lewis—*International Textbook*, 3rd ed., 606 p., illus., $6.50.

AUDUBON'S BIRDS OF AMERICA—*Macmillan*, 320 p., illus., $2.95. A selection of some of the best of Audubon's paintings. 288 full page 4-color-plates with a brief caption for each.

BOWERY TO BELLEVUE: The Story of New York's First Woman Ambulance Surgeon—Emily Dunning Barringer—*Norton*, 262 p., $3.00. The autobiography of a leader among American medical women.

THE CHEMISTRY AND METALLURGY OF MISCELLANEOUS MATERIALS: THERMODYNAMICS—Laurence L. Quill, Ed.—*McGraw-Hill*, 329 p., illus., $3.00. Volume 19B of the Metallurgical Project of the National Nuclear Energy Series contains general papers of important scientific data dealing with chemistry, refractories, metallurgy and thermodynamics.

COLOR TV—NOW OR LATER?—N. R. de Mexico—*Television Research Institute*, 18 p., paper, $2.00. A comparative survey and analysis of the three color systems and their impact on the industry.

EMPLOYMENT OUTLOOK FOR ENGINEERS—U. S. Dept. of Labor—*Gov't. Printing Office*, 119 p., illus., paper, 50 cents. Information on employment trends and outlook, earnings, and occupational mobility.

THE EXTRACTION OF OIL FROM OIL-BEARING MATERIALS BY PREPRESSING FOLLOWED BY SOLVENT EXTRACTION—Homer E. Rea, Jr. and A. Cecil Wamble—*Texas Engineering Experiment Station*, nine pages, illus., paper, free upon request to publisher, College Station, Texas.

GESTALT PSYCHOLOGY: Its Nature and Significance—David Katz—*Ronald*, 175 p., illus., $3.00. The author discusses the principles of gestalt psychology. Translated from the second German edition by Robert Tyson.

INDUSTRIAL ALCOHOL—P. Burke Jacobs—*Gov't. Printing Office*, U. S. Dept. of Ag. Misc. Publ. No. 695, 101 p., illus., paper, 30 cents. A study of the technology, production, and uses of alcohol in relation to agriculture.

ISOTOPES: Supplement No. 3 to Catalogue and Price List No. 3—*U. S. Atomic Energy Commission*, 25 p., paper, free upon request to publisher, Isotopes Division, Oak Ridge, Tenn. This supplement brings the July 1949 catalogue up-to-date.

THE MEANING OF ANXIETY—Rollo May—*Ronald*, 376 p., illus., $4.50. Brings together the theories of anxiety offered by modern explorers in different areas of our culture.

1950 CURRENT THERAPY—Howard F. Conn, Ed.—*Saunders*, 736 p., $10.00. Latest approved methods of treatment for the practicing physician.

PRACTICAL PHYSICS—Cyril Ashford—*Cambridge University Press*, 173 p., illus., $1.75. A collection of laboratory experiments.

POPOL VUH: The Sacred Book of the Ancient Quiche Maya—Delia Goetz and Sylvanus G. Morley (English version)—*University of Oklahoma Press*, 267 p., illus., $3.75. One of the few pieces of native American literature to survive the Spanish Conquest. It is generally regarded as America's oldest book and corresponds to the Christian Bible. Written from the Spanish translation by Adrian Recinos.

THE QUALITY OF MEDICAL CARE IN A NATIONAL HEALTH PROGRAM—Subcommittee on Medical Care—*American Public Health Association*, approx. 26 p., paper, 10 cents.

THE QUARTERLY JOURNAL OF CHILD BEHAVIOR, Vol. I, No. 1—Nolan D. C. Lewis, Managing Ed.—*Coolidge Foundation*, 131 p., paper, $8.50 per year ($9.50 outside continental U.S.A.), $2.50 single copy. A presentation of papers of interest to those who work with children in all fields.

RESEARCH IN MEDICAL SCIENCE—David E. Green and W. Eugene Knox, Eds.—*Macmillan*, 492 p., illus., $6.50. Presents 26 essays written by various outstanding representatives in the fields of chemotherapy, physiology, epidemiology, anthropology and allied sciences. Written in non-technical language these essays cover the outstanding developments to date in medical research.

SOCIAL SCIENCE RESEARCH COUNCIL ANNUAL REPORT, 1948-1949—*Social Science Research Council*, 63 p., paper, free upon request to publisher, 230 Park Ave., New York 17, N. Y.

SUGAR: Commodity Reports—*Food and Agriculture Organization of the United Nations*, 31 p., illus., paper, 25 cents. First of a series of periodic reviews on the world sugar situation to be issued by FAO.

THIRTIETH ANNUAL REPORT OF THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS 1944—*Gov't. Printing Office*, 558 p., illus., $3.75. Withheld because of war-time restrictions this report covers the fiscal year 1944 and includes technical reports Nos. 774 to 803. Contains some of the latest information on wind tunnels, new type propellers, and cooling of cylinders.

THE TRANSURANIUM ELEMENTS RESEARCH PAPERS, Part I & II—Glenn T. Seaborg, Joseph J. Katz and Winston M. Manning, Eds.—*McGraw-Hill*, Part I, 859 p., Part II approx. 862 p., illus., $15.00 (Cost includes Part I & II—not sold separately). This work consists of more than 150 original research papers covering investigations since 1940. Written by outstanding authorities.

TWO NEW SYPHACIA (NEMATODA: OXYURIDAE) AND OBSERVATIONS ON THE INNER CIRCLE CIRCUMORAL PAPILLAE IN NORTH AMERICAN SPECIES OF THE GENUS—Jack D. Tiner and Robert Rausch—*Chicago Academy of Science*, six p., illus., paper, 25 cents. A report of a study made in the states of Ohio, Wisconsin, Illinois, and Wyoming. Work also was done in Alaska.

Science News Letter, March 25, 1950

MEDICINE

Chemical Fights Leprosy

➤ SUCCESS with a new chemical weapon against leprosy is announced by scientists at the U. S. Marine Hospital (National Leprosarium) in Carville, La.

The chemical is promacetin, a sulfone closely related to promin, diasone and sulfetrone. It is given by mouth at meal time.

Improvement that is "uniform, universal and sustained" followed use of this chemical in a trial with 27 patients, some of them in an advanced stage of the disease.

A few of the patients had headache, drowsiness or stomach distress but there were no acute severe toxic symptoms from the drug. The stomach distress was relieved by sodium bicarbonate.

Skin spots and spots on the membranes of nose, mouth and throat began to show improvement within two to four weeks. Shrinking of the nodules did not begin until after at least one to two months of treatment. The number of leprosy bacilli, or germs, in the skin and mucous membranes was noticeably reduced at the end of one year of treatment and many patients at that period had no bacilli in the mucous membranes.

Better appetite, weight gain, an air of well-being, regrowth of hair on eyebrows, legs, arms and chest and more sensation in the feet and hands are among the signs of improvement shown by various of the patients.

Some patients had previously had treatment with other sulfones and had gotten better and then reached a stationary point of no further progress. These again improved when the new sulfone was given. This, the Carville scientists point out, suggests that alternating or combined methods of treatment in leprosy should be given.

Progress with use of promacetin in leprosy is reported by Drs. Frederick A. Johansen, Paul T. Erickson, Rolla R. Wolcott, William H. Meyer, Herman H. Gray, and B. M. Prejean and Sister Hilary Ross in Public Health Reports.

Science News Letter, March 25, 1950

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WADING POOL for children which can be used up-side-down as a raft, differs in construction from earlier types of back-yard rubberized pools. Its 10-inch-high side walls are made of two layers of neoprene-coated cotton fabric, connected by thousands of cross threads. The space between is the inflation chamber.

Science News Letter, March 25, 1950

STAMPING PRESS, for use by hobbyists to decorate leather or print names on plastic novelties, is an electrically heated device which imprints single lines up to three inches in length in gold, silver and colors. With it, any standard make up to 36-point type can be used.

Science News Letter, March 25, 1950

WALL-PAPERING DEVICE, recently patented, is a box-like affair to contain a roll of paper and the necessary paste. In use, it stands on the floor close to the wall. The paper, with paste applied, is drawn out the top and into position on the wall.

Science News Letter, March 25, 1950

PLASTIC DOMES for plant protectors are made of clear material, with sides shaped with sloping five-degree rib effect for strength, rigidity and ease of nesting as

shown in the picture. The clear plastic permits full-strength rays of the sun to enter.

Science News Letter, March 25, 1950

GONIOPHOTOMETER is a big name for a relatively simple laboratory device to measure how flat specimens of various substances reflect and transmit light under changing conditions. It utilizes a stationary photocell, a rotable specimen table, and a beam of light which can be set in different positions.

Science News Letter, March 25, 1950

PLUG-IN ATTACHMENT to use on the electric razor contains a tiny rectifier to convert ordinary household alternating electric current into direct current. The direct current is claimed to give speedier action to the razor and cut shaving time in half.

Science News Letter, March 25, 1950

BREATHING TUBE, to put in the mouth of an unconscious person to prevent choking on his tongue, is made of a durable, odorless, tasteless plastic that does not stick to skin tissues. Instead of the usual tube shape, it has a solid core with a channel on each side, open for easy inspection.

Science News Letter, March 25, 1950

ELECTRIC STEAM CLEANER, a portable type designed for use in mines to remove grease, dirt and other deposits from machinery and equipment, is safe to use where gaseous or explosive mixtures have previously made cleaning difficult. The unit is electrically heated and electrically powered.

Science News Letter, March 25, 1950

Do You Know?

Rest and diet are advised to check tooth *decay*.

The *surface area* of the skin on the human body is from 18 to 20 square feet.

The body's largest organ is the *skin*, weighing just about twice as much as either the liver or the brain.

Ethyl *ether*, as a priming agent, is said to be the most effective substance to use in starting a diesel engine in cold weather.

The Atlantic *rosefish*, now a popular food, is one of the few commercial species of fish that give birth to young instead of eggs.

The *iron* eaten in food or taken in medicine stays in the human body to be used and reused for more than six months after it has reached its destination in the blood.

Mineral deposits containing the rare elements *cerium* and *lanthanum* were found recently in California by geologists searching for uranium; present supplies of these elements are imported.

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